

Claims

1. A manufacturing cell for work pieces, comprising:
 - a device for machining a work piece,
 - 5 - one or more storage locations for fetching a work piece,
 - one or more storage locations for returning the work piece,
 - automated manipulating means for transfers of the work piece, which are arranged to grip the work piece, to place the work piece in the machining device and to deliver the machined work piece,
 - 10 - transfer means, which are arranged to transfer said manipulating means to and from said storage locations and said machining device, and
 - positioning means, wherein said manipulating means are arranged to deliver the work piece to said positioning means for setting the position of the work piece and for gripping it again after the setting,
 - 15 - wherein the positioning means are, together with the manipulating means, placed in said transfer means, or the positioning means are placed in separate transfer means, which are arranged to move said positioning means within the reach of the manipulating means at least for the time of said setting.
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- 25 2. The manufacturing cell according to claim 1, wherein there are two or more positioning means of the same type.
3. The manufacturing cell according to claim 1, wherein separate transfer means are arranged to move the positioning means to a predetermined constant distance in relation to the manipulating means, if necessary, also during that transfer movement of the manipulating means which takes place simultaneously with the setting of the position of the work piece.
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- 35 4. The manufacturing cell according to claim 1, wherein the machining device comprises an edging press or a press device intended for cutting or forming.

- 5 5. The manufacturing cell according to claim 1, wherein the storage location is a pallet, a platform or a conveyor, on which the work pieces are placed, wherein the work pieces are, for example, sheets or bent work pieces.
6. The manufacturing cell according to claim 1, wherein the manipulating means comprise a programmable robot.
- 10 7. The manufacturing cell according to claim 1, wherein the transfer means comprise a rail and a carriage moving back and forth along the rail, the manipulating means or the positioning means or both of them being placed on the carriage.
- 15 8. The manufacturing cell according to claim 1, wherein the positioning means comprise a support, along which the work piece is arranged to slide by the effect of gravity and to be placed in a desired position and location.
- 20 9. The manufacturing cell according to claim 8, wherein the positioning means also comprise sensor means, which are arranged to detect the adherence of several work pieces to each other.
- 25 10. The manufacturing cell according to claim 1, wherein the manipulating means comprise means for gripping work pieces, wherein they also comprise sensor means, which are arranged to detect the adherence of several work pieces to each other.
- 30 11. The manufacturing cell according to claim 1, wherein it also comprises sensor means, which are arranged to detect the adherence of several work pieces to each other by detecting the number of work pieces left in the storage location after the manipulating means have removed the work piece, to compare said number with the previous number.
- 35 12. A transfer and manipulating apparatus for work pieces, comprising:

- automated manipulating means for transfers of a work piece, which are arranged to grip the work piece and to deliver the work piece again,
- 5 - transfer means, which are arranged to transfer said manipulating means along a given path, for transferring work pieces to different locations, and
- 10 - positioning means, wherein said manipulating means are arranged to deliver the work piece to said positioning means for setting the position of the work piece and for gripping it again after the setting,
- 15 - wherein the positioning means are, together with the manipulating means, placed in said transfer means, or the positioning means are placed in separate transfer means, which are arranged to move said positioning means within the reach of the manipulating means at least for the time of said setting.

20 13. The transfer and manipulating apparatus according to claim 12, wherein there are two or more positioning means of the same type.

25 14. The transfer and manipulating apparatus according to claim 12, wherein separate transfer means are arranged to move the positioning means to a predetermined constant distance in relation to the manipulating means, if necessary, also during that transfer movement of the manipulating means which takes place simultaneously with the setting of the position of the work piece.

30 15. The transfer and manipulating apparatus according to claim 12, wherein the positioning means also comprise sensor means, which are arranged to detect the adherence of several work pieces to each other.

35 16. The transfer and manipulating apparatus according to claim 14, wherein the positioning means also comprise sensor means, which are arranged to detect the adherence of several work pieces to each other.

17. A positioning device for work pieces, which is arranged to center a work piece in a given position and in a given location, when the work

piece is placed in said device for positioning, wherein the positioning device is also equipped with sensor means, which are arranged to detect the adherence of several work pieces to each other, one upon the other, and whose operation is possible simultaneously with either
5 the arrival, the centering, the immobility, or exit of the work piece, wherein it is possible to avoid time delays caused by the detection in the work cycle.

18. The positioning device according to claim 17, wherein it comprises
10 guides, along which the work piece is arranged to slide freely by the effect of gravity and to be guided to a given location and to a given position.

19. The positioning device according to claim 17, wherein said sensor
15 means comprise a means which can be transferred against the work piece and which reaches a position, which can be used to determine, if there are one or more work pieces.

20. The positioning device according to claim 18, wherein said sensor
20 means comprise a means which can be transferred against the work piece and which reaches a position, which can be used to determine, if there are one or more work pieces.

21. The positioning means according to claim 17, wherein said sensor
25 means comprise optical means which are arranged to detect the side surfaces of work pieces placed next to each other, and if there are several work pieces placed in parallel.

22. The positioning means according to claim 18, wherein said sensor
30 means comprise optical means which are arranged to detect the side surfaces of work pieces placed next to each other, and if there are several work pieces placed in parallel.

23. The positioning device according to claim 17, wherein it is placed in
35 a stationary position, or fixed to transfer means which are arranged to move said positioning device along a desired path, or fixed in

automated manipulating means which are arranged to deliver a work piece to said positioning device or to remove said work piece.